

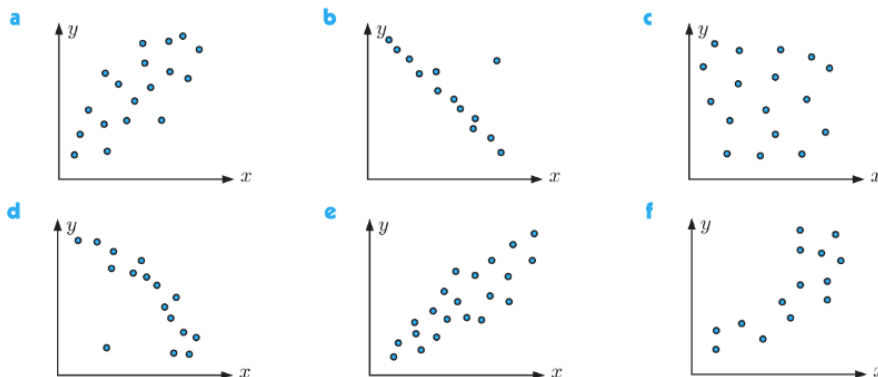
Warm Up # 4-4

1. In a competition to see who could hold their breath underwater the longest, the times were normally distributed with a mean of 150 seconds and a standard deviation 12 seconds. The top 5% of the contestants advance to the finals. What time is required to advance to the finals?
2. The life of a battery is normally distributed with a mean 33.2 weeks and standard deviation 2.8 weeks. A battery is chosen at random, find the probability that it will last at least 35 weeks. Assign a variable, use proper notation and a sketch to represent the situation.

HW Questions: p. 319

EXERCISE 11A

- 1 For each of the scatter diagrams below, describe the relationship between the variables. Consider the direction, strength, and linearity of the relationship, as well as the presence of outliers.



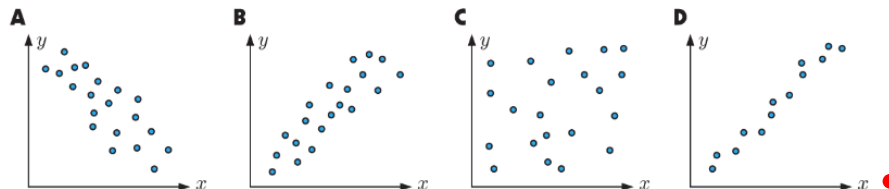
- 2 The scores awarded by two judges at an ice skating competition are shown in the table.

Competitor	P	Q	R	S	T	U	V	W	X	Y
Judge A	5	6.5	8	9	4	2.5	7	5	6	3
Judge B	6	7	8.5	9	5	4	7.5	5	7	4.5

- a Construct a scatter diagram for this data with Judge A's scores on the horizontal axis and Judge B's scores on the vertical axis.
- b Copy and complete the following comments about the scatter diagram:
 There appears to be,, correlation between Judge A's scores and Judge B's scores. This means that as Judge A's scores increase, Judge B's scores
- c Would it be reasonable to conclude that an increase in Judge A's scores *causes* an increase in Judge B's scores?

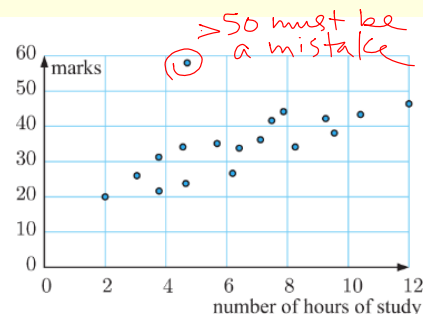
- 4 Choose the scatter diagram which would best illustrate the relationship between the variables x and y .

- a x = the number of apples bought by customers, y = the total cost of apples
- b x = the number of pushups a student can perform in one minute, y = the time taken for the student to run 100 metres
- c x = the height of people, y = the weight of people
- d x = the distance a student travels to school, y = the height of the student's uncle



- 5 The scatter diagram shows the marks obtained by students in a test out of 50 marks, plotted against the number of hours each student studied for the test.

- a Describe the correlation between the variables.
- b How should the outlier be treated? Explain your answer.



Yesterday's classwork:

Correlation Classwork

Name _____ Team _____ Per _____

Part 1 - Can one's success in Algebra 1 predict success in Geometry?

- ✓ Plot the data shown on a scatter plot with "Algebra" as the independent variable (x-axis). LABEL each axis.
- ✓ Calculate the mean Algebra score, $\bar{x} \approx 64.6$ and the mean Geometry score, $\bar{y} \approx 62.1$
- ✓ Plot the mean point, (\bar{x}, \bar{y}) , on the graph and mark with "M".
- ✓ Calculate the Pearson's Correlation Coefficient, $r \approx$ _____

Students	Algebra	Geometry
A	34	32
B	67	39
C	56	59
D	78	71
E	44	70
F	82	79
G	91	85

- ✓ Based on both the scatter plot and the correlation coefficient, comment on the correlation:

There is a _____ linear correlation between _____ and _____. As _____ increases, the _____.

- ✓ Calculate the LSRL (least squares regression line equation, with y on x) and add it to your graph.

$$\hat{y} \approx$$

- ✓ Using the LSRL, what Geometry score would be predicted from an Algebra score of 80?

Part 2 --- Linear Review

Find the equation of the line that passes through the given points (18, -6) and (9, 1)

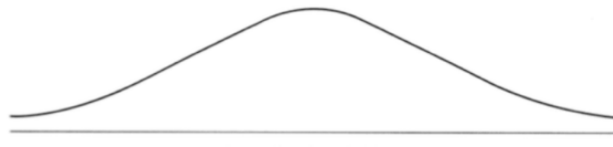
Using **slope intercept** format
 $y = mx + b$

Using **Point-Slope** format
 $y - y_1 = m(x - x_1)$

Part 3 --- Normal Distribution Practice

- A. The weights of pandas are normally distributed with a mean of 160 kg and a standard deviation of 15 kg.

(a) Show this information on the diagram below.



- (b) Write down the probability that a randomly selected panda is greater than 160 kg.
- (c) Write down the probability that a randomly selected panda is less than 130 kg.
- (d) The probability that a particular panda is less than x kg is 0.2. Find the value of x .

- B.** The IQs of IB students are normally distributed with a mean of 110 and a standard deviation of 15.

(a) Write down the probability that a randomly chosen student has an IQ within 2 standard deviations of the mean.

(b) Write down the probability that a randomly selected IB student has an IQ greater than 125.

(c) Calculate the probability that a randomly selected IB student has an IQ between 100 and 120.

A particular province has 1200 students taking the IB.

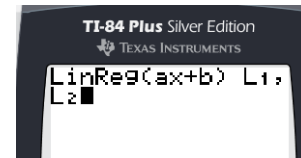
(d) Calculate an estimate for the number of students with an IQ greater than 100.

Calculating the Line of Best Fit (LSRL)

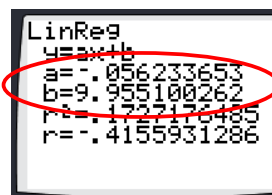
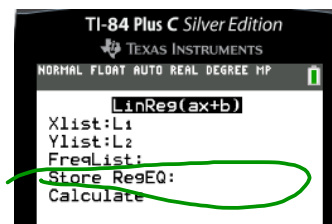
Select **STAT** then toggle to **CALC**, then to **LinReg(ax + b)**

Then the two lists which contain your data with a comma in between.

Select **ENTER** and the top two lines will give your *slope* and *y-intercept*



dependent variable



$$y \approx -0.0562x + 9.96$$

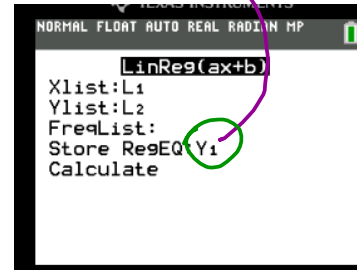
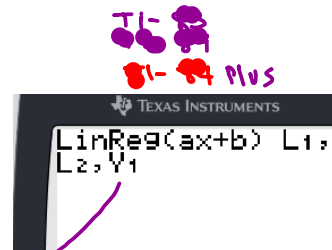
Viewing your line and your Scatter Plotsimultaneously

Select **STAT** then toggle to **CALC**, then to **LinReg(ax + b)**, Then add one more comma and Y_1 , then **ENTER**. Then **ZOOM 9**

to find Y_1 look for **VAR** then toggle to **Y-VARS** then **Function**

$y \approx$

T1-84
PLUS C



Today's Classwork:


Read starting at the bottom of p. 324, *Calculating r by hand*, through Example 3 on p. 325. Do 11B.2, p. 325 #1.

Read all of p. 328, *Line of best fit by eye*. Do 11C, p. 330 #1 (use graph paper).

part b) calculate r w/ calculator.

HW: 11B.1,
p. 322 # 1 - 3, 5, 6

correlation viewing

 <http://wilderdom.com/301/int/cor-guess.html>